GC COLUMN

Installation Quick Guide

BEFORE INSTALLATION

1. Cool all heated zones
2. Inspect any oxygen or moisture traps
3. Consider replacing septa, liner and o ring
4. Check the injection syringe (leak free and moves freely)

INSTALLATION

1. Mount the column on the oven bracket.
2. Uncoil both ends of the column ensuring enough length to reach injector/detector.
3. Slide a column nut and suitably sized ferrule (ensuring ferrule is facing correct direction) over each column end.
4. Cut 1 – 2 cm using a ceramic scoring wafer from each end of the column, use a magnifying glass to ensure column is smooth/straight.
5. Install column at the appropriate length to the injector and detector, using the handy SCION column ruler tool.
6. Tighten the column nuts finger tight and then a ½ turn with a wrench. If the column can still be moved tighten in ¼ increments until secure.
7. Restore working conditions to the GC – ensure there is carrier gas flow through the column before increasing oven temperature.
8. Raise the oven temperature to the column maximum isothermal temperature or 10 °C above the temperature of the method and bake out the column for 1 hour or until the detector output stabilizes.
9. Once the column has been baked out, restore initial method conditions – check if the column nuts need tightened, ferrules can sometimes deform on first being heated which can cause a leak.

STANDBY

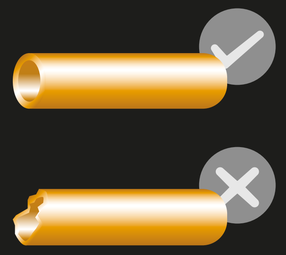
Short term: Column can be left installed in the GC – ensure carrier gas flow is left on.

Long term: Remove the column from GC, seal the ends of the column by inserting into the curved edge of a septa, store in the original box.

RECONDITIONING

- If column performance has dramatically reduced cut 20 cm from the front (Injector) end of the column.
- Reinstall the column and restore GC working conditions.
- Raise the oven temperature to the maximum isothermal temperature of the column and bake out for 2-3 hours.
- If the column performance is not restored consider replacing the column.

Proper & Improperly Cut Capillary



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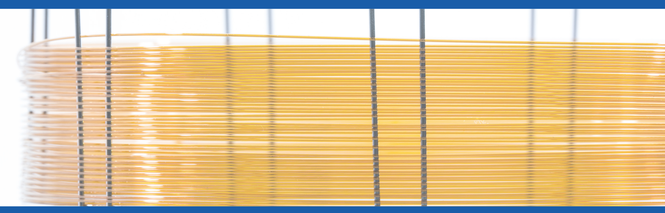
GC Troubleshooting

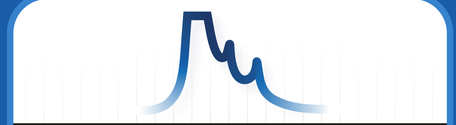
SCION INSTRUMENTS
A Techcomp Company

Indications of errors with the system or method

- ! Changes in peak shape/height (different than what was expected/known)
- ! Changes in retention time (other than expected change from cutting column during installation)
- ! Instability of the baseline
- ! Asymmetrical peak shapes, non-Gausian
- ! Any unusual behavior of expected peaks

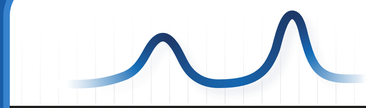


Top tips to restore your chromatography:



LONG SOLVENT PEAK TAIL

Possible cause	Solution
Injector temperature too high	Lower initial injector temperature.
Injector leak	Check septa, liner, and column installation and injector fittings.

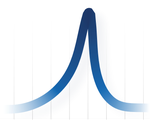


NO SAMPLE PEAK / LOW RESPONSE

Possible cause	Solution
Injector leak	Check septa, liner, column installation and injector fittings.
Syringe leak	Replace the syringe.
Broken column	Replace column.

HIGH BOILING COMPOUNDS NOT ELUTING (°C60 TO °C80)

Possible cause	Solution
Incorrect column phase	Change column phase – use high temperature column i.e. SCION-5HT or SCION-SimDist.
Oven program unsuitable	Increase oven temperature (ensure this is not above column temperature limit).
Injector temperature too low	Increase temperature (be mindful of column temperature limit).

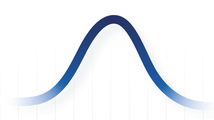


PEAK FRONTING

Possible cause	Solution
Overloaded column	Decrease injection volume, dilute sample or use columns with thicker film.
Restriction of the carrier gas flow	Check injection liner and column connections for any obstructions.

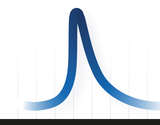
SPLIT PEAKS
(Multiple peaks corresponding to a single compound)

Possible cause	Solution
Injection volume is too large	Change method injection volume.
Injector temperature is too low	The temperature should be no more than 20°C below the boiling point of the sample diluent.
Improper column installation	Reinstall column.



PEAK BROADENING / POOR RESOLUTION

Possible cause	Solution
Degraded column	Recondition column. If no improvement is seen, ultimately replace the column.
Contaminated liner	Replace liner.
Wrong carrier gas flow	Check carries gas flow.

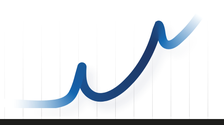


PEAK TAILING

Possible cause	Solution
Column degradation	Cut length of column from inlet end and reinstall – if no improvement consider replacing column.
Sample adsorption	Recondition column.
Contaminated or blocked liner	Replace liner.
Increased dead volume	Check make-up gas flow, injector assembly and column connections.
Improper functionality of the injector heating	Check injector heating/cooling functions.

APPEARANCE OF GHOST PEAKS

Possible cause	Solution
Improper sampling or sample prep	Start a run with no injection (system blank) – this will show if the issue is with the system or with sampling/sample preparation.
Contaminated injector	Replace the septa and liner, if no improvement clean and bake out injector.
Contaminated injection syringe	Replace syringe.
Contaminated solvent source	Use a fresh bottle or different batch.



EXTREME BASELINE INCREASE DURING TEMPERATURE PROGRAMMING

Possible cause	Solution
Column temperature limit is exceeded	Reduce maximum temperature. Change the column film thickness with regards to the sample. For high non-polar compounds with a high retention time, a film thickness of 0.1 is advised.
Contamination	Check gas filters. Correct all leaks, condition the column.
Instrument problems	Use an uncoated column and rerun the temperature program. If no problems arise from this run, the column being an issue can be excluded.